

**APM 153: Computer Methods for Engineers and Physical Scientists, Spring 2006**  
**Lecture: MWF 8:25-9:20 am**

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**Course Description:**

APM 153 is a computer-based course in mathematics and problem-solving. The most important skill to be learned in this course is algorithm design. An algorithm is a step-by-step set of instructions used to solve a problem or to write a computer program. The course teaches you how to develop algorithms to solve increasingly sophisticated problems in mathematics and engineering and to convert your algorithms into programs in MathCad, Matlab, Excel, and Visual Basic. The goals of the course are to (1) help you develop new skills in mathematics, computer science, and problem-solving, (2) to increase your confidence in your ability to use mathematics and computers, and (3) to prepare you for subsequent coursework at ESF which will rely upon the computer and mathematics skills taught in this course.

**Course Outcomes:** By the end of this course each student should be able:

1. To design algorithms to solve problems in mathematics and logic;
2. To convert algorithms into a program in Matlab, Excel, Visual Basic, or MathCad;
3. To properly document your solution;

**Standards of Professional Practice:** A great deal of emphasis in this class will be placed on standards of professional practice. These standards include both the quality and the integrity of the work you turn in for credit. Professional “quality” means assignments look professional, are complete, and include proper documentation. Each week your instructor will review what is expected for each assignment to help you achieve professional quality work. Professional “integrity” means that assignments are turned in on time and that each student does his or her own work. The concept of professional integrity also extends to conduct in and out of class. Students will be expected to follow the class policies described below.

**Attendance:** Class will begin on time at 8:25. Students are expected to be in their seats and prepared to begin at that time. Attendance is expected at all class meetings. Individual absences will be recorded and used to evaluate student participation and preparation. Individual attendance and preparation will be used to assign course grades. For example, **do not make plans to miss class before or after spring break.** It is possible to drop an entire grade just by missing class before or after spring break.

**Preparation** : Students are expected to come to class prepared. For example, being prepared means having done the reading assignment or other assigned work. Being prepared also means bringing your textbook, your notebook, and any other materials you need for lecture or lab. Preparation also means being prepared when you come to see the instructor or the TA for help. The instructor and the TA's cannot help you improve homework you have not yet begun. Start your homework before seeking assistance.

**Quizzes:** One or more unannounced quizzes will be given during the semester to help evaluate individual attendance and preparation. Quizzes will be given within the first five minutes of class. Students arriving too late to take the quiz will receive a zero.

**Homework** – Homework must be turned in at the beginning of class on the day it is due, usually at the beginning of the lab period on Friday. If you turn the homework in later that day, it is late. Even if you turn it in at the end of class, it is late. If you wait and turn your homework in one or more days after it is due, it is really late. Turning in homework late will result in an automatic reduction of your grade by at least 20%. In addition, homework must be complete and professionally done. Your instructor will review with the class how your homework should look and what each assignment should contain. There will be at least 12 homework assignments during the semester.

**Course Project** – Each student will complete an individual course project based upon a problem in science or engineering from another class. The project will count as one homework assignment.

**Portfolio** - At the end of the semester each student will turn in a portfolio containing an electronic copy of all their assignments and their course project. The portfolio is used by the department to document the work students do in APM 153. The portfolio will count as one homework assignment.

**Grading:** Students will be graded on two, one-hour exams, a final exam, quizzes, weekly homework assignments, and an individual course project. The grading for the class will be 30% for the hourly exams (15% each), 20% for the final exam, and 40% for the weekly assignments. The last 10% of your grade will be based upon attendance, preparation, and participation. Grades will be assigned using the following scale.

A	-	93% or higher	C+	-	77 – 80%
A-	-	90 – 93%	C	-	73 – 77%
B+	-	87 – 90%	C-	-	70 – 73%
B	-	83 – 87%	D	-	60 – 70%
B-	-	80 – 83%	F	-	Less than 60%

## **Textbook and other Course Supplies:**

**Textbook** - You are **required** to purchase the textbook. The textbook for this course is “Matlab Programming for Engineers” by Stephen J. Chapman. 3<sup>rd</sup> Edition. Make sure you buy the 3<sup>rd</sup> Edition! The textbook is available at the S.U. Bookstore. You will need your own textbook for the reading assignments and for the exams.

**3-Ring Binder** - You are **required** to purchase a 3-ring Notebook to hold handouts such as lecture notes and assignments. Keeping all your APM 153 papers together in a 3-ring notebook is part of being prepared for class. As such you will be graded on your notebook. In addition, you will be allowed to use only your textbook and the notes you bring with you in your 3-ring binder during the exams. In addition to the handouts given to you in class, you will need some paper for additional notes you write in class.

**USB Drive** – You are **required** to purchase a USB drive to store backup copies of your programs. I recommend getting a drive capable of holding 30 MB of data or more.

**Matlab Release 14** – Although not required, it is highly recommended that you purchase a copy of the Matlab software we will be using this semester. Matlab Release 14 with Simulink is available at the Schine Bookstore for about \$125 - \$130 with your student I.D. Matlab may also be purchased online at <http://www.mathsoft.com>.

**MathCad 13** – You may also consider buying a student copy of MathCad 13, which is also available at the Schine bookstore and costs about the same as Matlab. While we will spend 6-8 weeks learning Matlab, we will also spend about 4 weeks using Mathcad.

**Texas Instruments TI-83, TI-85, TI-89** – You probably already own a programmable calculator such as the TI-83, TI-85, or TI-89. We will spend about one week learning how to write computer programs for this type of calculator. If you do not own one of these calculators, you may borrow one to bring to class. If you do own one of these calculators, you may wish to purchase a “TI-Graph Link USB Cable” which will allow you to download programs from your computer to your calculator.

**Academic Misconduct:** Students are encouraged to work together to help each other learn the material. However, assignments turned in for credit must be primarily the work of each individual student. Your work must be your own. Copying homework or allowing someone else to copy your homework constitutes one form of academic misconduct.

In addition to the wholesale sharing of homework, academic misconduct includes plagiarism (such as copying an algorithm or solution out of a book) and receiving or giving assistance during exams, take-home exams, or quizzes. Your instructor will review with the class how much cooperation you will be allowed for different types of assignments and any other expectations for exams or quizzes. But in general, the following guidelines apply.

#### SOME

**Homework** – Some cooperation is okay, but your work must be your own!

**Course Project** – Getting help from a friend is okay, but again, it is your project.

#### NONE

**Take-Home Exams/Quizzes** – No help may be asked for or given. If you have a question or a problem, ask your TA or your instructor.

**Exams** – No help may be asked for or given. If you have a question or a problem, ask your TA or instructor.

For more information about what constitutes academic misconduct students are encouraged to refer to the SUNY ESF Undergraduate Catalog.

**Professional Conduct:** Professional conduct is important. Being a professional is more than just knowing the material, it includes learning how to interact and work with other people. Professional conduct means doing your work and meeting expectations, but it also means treating other people -- your classmates, your TA's and your instructor -- with respect and consideration.

**Cell Phones:** The use of cell phones is not allowed during lectures or other class activities. Cell phones must be turned off or not brought to class. The instructor reserves the right to ask anyone with a ringing cell phone to leave class for the day.

**Expectations:** Just as you have high expectations for your instructors and TA's, we have high expectations for you. Do your best. Every class, including this one is a chance for a fresh start. Make the most of it.

The definition of disappointment is an unmet expectation.